Atty. Dkt.: FEC 150NP

REMARKS

The specification, claims and abstract have been amended editorially for reasons unrelated to any provision of 35 USC. The amendments to the specification are made by way of the attached Substitute Specification. No new matter has been added. Formal Drawings also are submitted. Examination of the amended application is respectfully requested.

Respectfully submitted,

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Date

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MARKED SPECIFICATION

Electromagnetic Contactor

Background of the Invention

Technical Field

The present invention relates to an electromagnetic contactor used for opening or closing a motor circuit, for example, and more specifically, to the processing of emission arc gas caused when a contact point is opened or closed.

Prior Art

The processing of ~~emission~~ arc gas emissions in an electromagnetic contactor is disclosed, for example, in Japanese Laid Open Utility Model Publication No. 01-70228. Conventional examples ~~of~~ will be described with reference to Figs. 3 to 5 ~~will be described~~. Fig. 3 is a longitudinal sectional view of a tripolar electromagnetic contactor. Fig. 4 is a perspective view of a power distribution part of the center pole of the electromagnetic contactor of Fig. 3[[.]], and Fig. 5 is a plan view of the main part of Fig. 4. With reference to Figs. 3 to 5 (Fig. 3 in particular), the electromagnetic contactor has a main contact point 3 for a plurality of phases (three ~~phase~~ phases in the drawing), consisting of a pair of fixed contacts 1~~, 1~~ opposed to each other, and a movable contact 2 for bridging the space therebetween. One end of ~~the~~ each fixed contact 1 and both ends of the movable contact 2 are jointed with a fixed contact point 4 and a movable contact point 5, respectively. The other end of the fixed contact 1 is integrated with a main terminal 6. The mold case of the electromagnetic contactor consists of an upper frame 7 and a lower frame 8. The fixed contact 1 is pressed into the slot of the upper frame 7 from left and right in Fig. 3~~, respectively~~. The top part of the upper frame 7 is attached with an arc-suppressing cover 9 so as to cover the main contact point 3.

The movable contact 2 is inserted into a movable contact support 10 and is retained by a contact spring ~~11~~ (compression coil ~~spring)~~spring) 11. The movable

contact support 10 is guided to ~~an~~ the upper frame 7 in a slidable manner in the longitudinal direction of Fig. 3 and is connected with a movable iron core 12. On the other hand, the lower frame 8 stores therein a fixed iron core 13 and an electromagnetic coil 14. ~~The space between the electromagnetic coil 14 and the moveable iron core 12 is inserted with a~~ A return spring 15, consisting of a compression coil spring for biasing the movable iron core 12 in the upper direction of Fig. 3, is inserted in the space between the electromagnetic coil 14 and the movable iron core 12. Reference numeral 16 denotes a coil terminal for connecting the electromagnetic coil 14 to an operation circuit (not shown).

In Fig. 4, the neighboring main contact points 3 have between them an interphase barrier 17 integrated with the upper frame 7 (only one side thereof is shown in Fig. 4). The front and rear parts of the main contact point 3 ~~((~~are spaced from the main terminal 6~~))~~ ~~are covered with are covered with~~ by a front and rear wall 18 of the arc-suppressing cover 9. As shown in Fig. 4 of the drawings ~~drawing~~, the front and rear wall 18 consists of the combination of a center part 18a having a "T"-shaped cross section and a left and right part 18b having a "J"-shaped cross section, between which an emission window 19 is provided, through which arc gas passes ~~is provided~~. An emission window 20 also is provided between the "J"-shaped part 18b and the interphase barrier 17 (the space extending to the side wall of the upper frame 7 for one side ~~with regards~~ relative to the main contact point 3 for left and right poles).

In Figs. 4 and 5, the inner wall face of the interphase barrier 17 (the inner wall face of the side wall of the upper frame 7 for one side ~~with regards~~ relative to the main contact point 3 for left and right poles) includes a step in accordance with the outer end face of the arc-suppressing cover 18. The space in which the main terminal 6 is provided has an increased width between the left and right inner wall faces. As shown in Fig. 5, the width of the main terminal 6 is determined in accordance with the size of the above increased width between the inner wall faces, and the width of the fixed contact 1 integrated with the main terminal 6 has a narrower width than that of the main terminal 6. The vicinity of the root of the fixed

contact 1 to the main terminal 6 is integrated with a pair of left and right attachment pieces 21 projecting in a hook-like manner. As already described, ~~as regards~~ regarding the interphase barrier 17 partially shown in the perspective view of Fig. 5 (the side wall of the upper frame 7 for one side with regards to the main contact point 3 of left and right poles [the same applies to the following description]), the fixed contact 1 is pressed into the slot 22 via the attachment piece 21.

In Fig. 3, when the electromagnetic coil 14 is excited, the movable iron core 12 is attracted toward the fixed iron core 13 by the elastic force of the return spring 15. As a result, the movable contact 2 bridges the space between the fixed contacts ~~1,~~ 1 to close the power distribution path for each phase. Thereafter, when the electromagnetic coil 14 is demagnetized, the movable iron core 12 is returned to the position shown by the restoring force of the return spring 15 to open the power distribution path for each phase. When the opening or ~~close~~ closing operation (the opening operation in particular) is performed, an arc is created between the fixed and movable contact points 4 and 5, which results in the mold resin (e.g., upper frame 7, movable contact support 10) being heated ~~up~~ to a high temperature, and evaporating, ~~causing~~ thereby to create "arc gas." ~~This~~ The resultant increase in internal pressure in the surrounding space of the main contact point 3, enclosed by the upper frame 7, the arc-suppressing cover 9, and the movable contact support 10, causes the arc gas to ~~be blown out~~ pass to the exterior via the emission windows 19 and 20 along the paths shown by the arrows in Figs. 4 and 5.

~~When the arc is blown out as described above, the~~ This arc gas, which remains at a high temperature as it is passing through the emission window 20 in particular, flows along the ~~planer~~ planar inner wall face of the interphase barrier 17 or the side wall of the upper frame 7. As a result, the arc gas immediately reaches~~, while maintaining the high temperature caused at the generation,~~ the emission window 20, while maintaining the high temperature, and therefore heats the attachment piece 21 and/or the main terminal 6. This can cause a problem in which, if the arc gas is emitted with a high frequency, the temperature of the main terminal 6 exceeds a certain limit, leading to damage of the wiring cable. The attachment piece 21 is also